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Rutland City BRF 3000 (2014036)
SUBMITTAL 85.2

Issued 04/18/16
Respond by 04/22/16

To

Timothy Pockette, PE

Topic BRF3000 Subm 85.2 (19) Ripley Bridge Bearing Shop Drawings R2
Status For Approval

Message Revised per previous comments.

Courtesy Copy

Volker H.D. Burkowski

From

MICHAEL MARTIN

Signed by

Date 04/18/2016

Proceed as Indicated

Owner Authorized Representative

Date

product data

carboline®

Carboguard® 635
VOC**Selection & Specification Data**

Generic Type	Cross-linked epoxy polymeric amine
Description	An all-purpose immersion-grade epoxy that has a variety of attributes including low-temperature cure, surface tolerance, fast recoat times, moisture tolerance during application and cure, and excellent corrosion protection. It has low VOC and low HAP's content for use in areas with restricted volatile emissions. Can be used direct to metal as a corrosion resistant primer or as an intermediate coating over other primers. Suitable for both maintenance and new construction projects due to its excellent surface wetting characteristics and quick cure for handling. May also be used for immersion in fresh or salt water (marine) exposures.
Features	<ul style="list-style-type: none"> • Low temperature cure (20°F) • Excellent corrosion protection • Excellent application characteristics • Fast recoat times • Moisture tolerance during application • Extended recoat window for atmospheric exposures (6 months for most topcoats) • Low VOC and low HAPs content
Color	Custom colors available. See Carboline color chart.
Gloss	Satin
Primer	Self-Priming
Dry Film Thickness	4.0 - 6.0 mils (102 - 152 microns) per coat
	DFT in excess of 8.0 mils per coat is not recommended.
Solids Content	By Volume 65% +/- 2%
Theoretical Coverage Rate	1043 ft ² at 1.0 mils (25.6 m ² /l at 25 microns) 261 ft ² at 4.0 mils (6.4 m ² /l at 100 microns) 174 ft ² at 6.0 mils (4.3 m ² /l at 150 microns)
VOC Values	Allow for loss in mixing and application. Thinner 236 E (12 oz/gal): 2.05 lbs/gal (246 g/l) Thinner 242 E (12 oz/gal): 2.05 lbs/gal (246 g/l) Thinner 76 (12 oz/gal): 2.50 lbs/gal (300 g/l) As Supplied 2.05 lbs/gal (246 g/l) These are nominal values and may vary slightly with color. Product contains VOC-exempt t-butyl acetate. Check local regulations regarding product usage.
Dry Temp. Resistance	Continuous: 180 °F (82 °C) Non-Continuous: 220 °F (104 °C)
Limitations	Epoxies lose gloss, discolor and eventually chalk in sunlight exposure. Do not apply over latex coatings. For immersion projects use only factory made material in special colors. Consult Technical Service for specifics.

Substrates & Surface Preparation

General	Remove any oil or grease from surface to be coated with clean rags soaked in Carboline Thinner #2 or toluol.
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Substrates & Surface Preparation

Steel	<p><u>Atmospheric Exposure:</u> For optimal performance: Hand Tool or Power Tool clean in accordance with SSPC-SP 2, SSPC-SP 3, or SSPC-SP11 to produce a rust-scale free surface.</p> <p>For maximum performance: SSPC-SP 6 (or greater) with a 1½-3 mil (40-75 micron) blast profile.</p> <p><u>Immersion Service:</u> White metal cleanliness in accordance with SSPC-SP10 minimum.</p>
Galvanized Steel	Galvanizing requires a roughened surface for optimum adhesion/performance of high build epoxies. Remove any contaminants per SSPC-SP1; ensure there are no chemical treatments that may interfere with adhesion; and abrade the surface to establish a suitable roughness (typically 1 mil). SSPC-SP7 or SP11 are acceptable methods.
Concrete or CMU	Remove all loose, unsound concrete. Remove all oils or other non-compatible sealers or treatments. Do not apply coating unless the concrete has cured at least 28 days @ 70 F (21 C) and 50% relative humidity or equivalent. Consult Carboline Technical Service for more specific recommendations.
Stainless Steel	Surface profile should be a dense angular 1-3 mils and is best achieved through abrasive blasting. Remove all contaminants that would interfere with the performance of stainless steel for the intended service such as, but not limited to, imbedded iron or chlorides.

Mixing & Thinning

Mixing	<p>Mix separately, then combine and mix in the following proportions (4:1 ratio):</p> <p>1 Gal. Kit Part A: 0.8 gallon Part B: 0.2 gallon</p> <p>5 Gal. Kit Part A: 4 gallon Part B: 1 gallon</p>
Thinning	For atmospheric applications thin up to 10% by volume with Carboline Thinner 242E, 236E, or 76. Use up to 10% with Thinner 33 for brush and roller.
Pot Life	3 hours at 75°F (24°C) and less at higher temperatures. Pot life ends when coating becomes too viscous to use.

Application Equipment Guidelines

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

Spray Application (General)	This is a high solids coating and may require adjustments in spray techniques. Wet film thickness is easily and quickly achieved. The following spray equipment has been found suitable and is available from manufacturers. Hold gun 12-14 inches from the surface and at a right angle to the surface.
Conventional Spray	Pressure pot equipped with dual regulators, 3/8" I.D. minimum material hose, 0.070" I.D. fluid tip and appropriate air cap.

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Carboguard® 635 VOC

Application Equipment Guidelines

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

Airless Spray Pump Ratio: 30:1 (min.)
Volume Output: 9.5 l/min min (2.5 gpm min.)
Material Hose: 905 mm min (3/8" I.D. min.)
Tip Size: 0.43-0.53 mm (0.017-0.021")
Output Pressure: 140-175kg/cm² (2000-2500 psi)
*PTFE packings are recommended and available from pump manufacturer.

Brush & Roller (General) For applications over damp surfaces, brush and roller is the preferred method. Multiple coats may be required to obtain desired appearance, recommended dry film thickness, and adequate hiding. Avoid excessive re-brushing or re-rolling. For best results, tie-in within 10 minutes at 75°F (24°C). Use a short-nap synthetic roller cover with phenolic core.

Application Conditions

Condition	Material	Surface	Ambient	Humidity
Minimum	45 °F (7 °C)	20 °F (-7 °C)	20 °F (-7 °C)	0%
Maximum	90 °F (32 °C)	120 °F (49 °C)	100 °F (38 °C)	95%

Industry standards are for substrate temperatures to be above the dew point. Carboguard 635 is unique in that it can tolerate damp substrates. See Brush or Roller above. Special thinning and application techniques may be required above or below normal conditions.

Curing Schedule

Surface Temp.*	Dry to Handle	Dry to Topcoat Minimum	Dry to Topcoat Maximum	Dry to Touch
20 °F (-7 °C)	36 Hours	24 Hours	180 Days	4 Hours
35 °F (2 °C)	18 Hours	2 Hours	180 Days	2 Hours
50 °F (10 °C)	11 Hours	1 Hours	180 Days	1 Hours
75 °F (24 °C)	3 Hours	45.0 Minutes	180 Days	30.0 Minutes
90 °F (32 °C)	2 Hours	30.0 Minutes	180 Days	15.0 Minutes

These times are to be used as a guideline for non-immersion applications. The longer the first coat has to cure, particularly in sunlight exposure or elevated temps, the higher risk of inadequate adhesion. If those maximum recoat times have been exceeded, the surface must be abraded by sweep blasting or sanding prior to the application of additional coats. Contact your local Carboline Representative for assistance/guidance.

The listed times in the chart above are based on a 4-6 mil (100-150 micron) dry film thickness per coat. Deviation from those thicknesses may compromise the performance and adhesive properties of the film. Higher film thickness, insufficient ventilation or cooler temperatures could result in solvent entrapment and premature failure. Excessive humidity or condensation on the surface during curing will not affect performance but may cause discoloration and result in a surface haze. Any haze or bluish must be removed by water washing before recoating. For force curing, contact Carboline Technical Service for specific requirements.

*Do not apply to substrates with ice or ice crystal formation. Dehumidify or raise the temperature to eliminate ice on the substrate. This product will tolerate drops in temperature to 0°F (-17°C) during its cure and will continue to cure when the temperature rises. Follow "Cure for Service" guideline listed above to determine when the product is fully cured.

Surface Temp.*	Dry to Topcoat Minimum	Dry to Topcoat with Antifoulant Maximum	Dry to Topcoat with Itself
20 °F (-7 °C)	24 Hours	36 Hours	30 Days
35 °F (2 °C)	2 Hours	16 Hours	30 Days
50 °F (10 °C)	1 Hours	8 Hours	30 Days
75 °F (24 °C)	45.0 Minutes	4 Hours	30 Days
90 °F (32 °C)	30.0 Minutes	3 Hours	30 Days

The curing schedule above references curing times for immersion service when an antifoulant topcoat is used.

The optimum time to topcoat with an antifoulant is when the film is "touch-tacky." If the touch-tacky time has been exceeded, or if the film is "glossy," you can generally re-prime/refresh the first coat with a fresh coat of itself. High temps and/or sunlight exposure may shorten this recoat schedule.

Marine Use: Undocking time of 24 hours @ 75°F

Cleanup & Safety

- Cleanup** Use Thinner 2 or MEK. In case of spillage, absorb and dispose of in accordance with local applicable regulations.
- Safety** Read and follow all caution statements on this product data sheet and on the MSDS for this product. Wear protective clothing, gloves and use protective cream on face, hands and all exposed areas.
- Ventilation** When used as a tank lining or in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. User should test and monitor exposure levels to insure all personnel are below guidelines. If not sure or if not able to monitor levels, use MSHA/NIOSH approved supplied air respirator.
- Caution** This product contains flammable solvents. Keep away from sparks and open flames. All electrical equipment and installations should be made and grounded in accordance with the National Electric Code. In areas where explosion hazards exist, workers should be required to use non-ferrous tools and wear conductive and non-sparking shoes.

Packaging, Handling & Storage

- Shelf Life** Part A: 24 months at 76°F (24°C)
Part B: 24 months at 76°F (24°C)
*Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.
- Shipping Weight (Approximate)** 1 Gal Kit - 14 lbs (6.4 kg)
5 Gal Kit - 65 lbs (29.5 kg)
- Storage Temperature & Humidity** 40 -100°F (4°C-38°C)
0-95% Relative Humidity
- Flash Point (Setaflash)** Part A: 66°F (19°C)
Part B: 80 °F (27°C)
Mixed: 77°F (25°C)
- Storage** Store Indoors. KEEP DRY



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product data


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Carbothane® 133 LH**Selection & Specification Data**

Generic Type	Aliphatic Acrylic-Polyester Polyurethane
Description	High build, low sheen finish that has excellent resistance to corrosion, chemicals and abrasion. Suitable for application over a number of Carboline primers and intermediates, this material provides very good weathering performance in a broad range of colors.
Features	<ul style="list-style-type: none"> Exceeds SSPC Paint 36 specification for a Level 3 urethane Outstanding performance properties in both mild and aggressive environments High build; suitable for many two-coat systems Application by spray, brush or roller Indefinite recoatability VOC compliant to current AIM regulations Low HAPs content
Color	Refer to Carboline Color Guide.
Finish	Satin to Low Sheen Semi-Gloss
Primer	Carbozinc, Carboguard and Carbomastic or other primers as specified. Refer to Substrates & Surface Preparation. Topcoat with Carbothane® Clear Coat when required.
Dry Film Thickness	3.0 - 5.0 mils (76 - 127 microns) per coat
	Dry film thickness in excess of 7 mils (175 microns) per coat is not recommended.
Solids Content	By Volume 61% +/- 2%
Theoretical Coverage Rate	978 ft ² at 1.0 mils (24.0 m ² /l at 25 microns) 326 ft ² at 3.0 mils (8.0 m ² /l at 75 microns) 196 ft ² at 5.0 mils (4.8 m ² /l at 125 microns)
	Allow for loss in mixing and application.
VOC Values	Thinner 255 E Thinned 5%: 2.7 lbs/gal (324 g/l) As Supplied 2.7 lbs./gal (324 g/l)
	These are nominal values and may vary slightly with color.
Dry Temp. Resistance	Continuous: 200 °F (93 °C) Non-Continuous: 250 °F (121 °C)

Substrates & Surface Preparation

General	Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other contaminants that could interfere with adhesion of the coating. Refer to the specific primer's Product Data Sheet for detailed requirements of the specified primer.
Steel	SSPC-SP6 with a 1.5-2.5 mil (37.5-62.5 micron) surface profile for maximum protection. SSPC-SP2 or SP3 as minimum requirement. Prime with specific Carboline primers as recommended by your Carboline sales representative.
Galvanized Steel	Prime with specific Carboline primers as recommended by your Carboline Sales Representative. Refer to the specific primer's Product Data Sheet for substrate preparation requirements.

Substrates & Surface Preparation

Aluminum	SSPC-SP1 and prime with appropriate Carboline primer as recommended by your Carboline sales representative.
Previously Painted Surfaces	Lightly sand or abrade to roughen and degloss the surface. Existing paint must attain a minimum 3A rating in accordance with ASTM D3359 "X-Scribe" adhesion test. Prime with specific Carboline primers as recommended by your Carboline sales representative.

Mixing & Thinning

Mixing	Power mix Part A separately, then combine with Part B and power mix. DO NOT MIX PARTIAL KITS.
Thinning	Thinning not normally required. Carboline Thinner 225E, 236E, 243E or 255E may be used to thin this product to minimize HAP and VOC emissions. Thinner 25 may also be used. Consult Carboline Technical Service for guidance. Use of thinners other than those supplied or recommended by Carboline may adversely affect product performance and void product warranty, whether expressed or implied.
Ratio	4:1 Ratio (A to B) 1.0 Gal. Kit Part A: 1 gal. can (partial filled) UC 8800: 1 qt. (partial filled) 5.0 Gal. Kit Part A: 5 gal. can UC 8800: 1 gal. (partial filled)
Pot Life	4 Hours at 75°F (24°C) and less at higher temperatures. Pot life ends when coating becomes too viscous to use. MOISTURE CONTAMINATION WILL SHORTEN POT LIFE AND CAUSE GELLATION.

Application Equipment Guidelines

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

Spray Application (General)	This is a high solids coating and may require adjustments in spray techniques. Wet film thickness is easily and quickly achieved. The following spray equipment has been found suitable and is available from manufacturers such as Binks, DeVilbiss and Graco
Conventional Spray	Pressure pot equipped with dual regulators, 3/8" I.D. minimum material hose, .070" I.D. fluid tip and appropriate air cap.
Airless Spray	Pump Ratio: 30:1 (min.)* GPM Output: 3.0 (min.) Material Hose: 3/8" I.D. (min.) Tip Size: .013-.015" Output PSI: 2100-2300 Filter Size: 60 mesh *Teflon packings are recommended and available from the pump manufacturer.

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Carbothane® 133 LH

Application Equipment Guidelines

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

Brush & Roller (General)	Multiple coats may be required to obtain desired appearance, recommended dry film thickness and adequate hiding. Avoid excessive rebrushing or re-rolling. For best results, tie-in within 10 minutes at 75°F (24°C).
Brush	Recommended for touch-up only. Use a medium, natural bristle brush.
Roller	Use a medium-nap synthetic roller cover with phenolic core.

Application Conditions

Condition	Material	Surface	Ambient	Humidity
Minimum	40 °F (4 °C)	40 °F (4 °C)	40 °F (4 °C)	0%
Maximum	100 °F (38 °C)	110 °F (43 °C)	110 °F (43 °C)	90%

Industry standards are for substrate temperatures to be 5°F (3°C) above the dew point. This product simply requires the substrate temperature to be above the dew point.

Caution: This Product is moisture sensitive in the liquid stage and until cured. Protect from high humidity, dew and direct moisture contact until cured. Application and/or curing in humidities above maximum, or exposure to moisture from rain or dew may result in a loss of gloss and/or microbubbling of the product

Curing Schedule

Surface Temp.*	Dry to Handle	Dry to Recoat	Final Cure General
40 °F (4 °C)	24 Hours	24 Hours	28 Days
50 °F (10 °C)	15 Hours	15 Hours	14 Days
75 °F (24 °C)	6 Hours	6 Hours	7 Days
90 °F (32 °C)	3 Hours	3 Hours	4 Days

These times are based on a 3.0-5.0 mil (75-125 micron) dry film thickness. Higher film thickness, insufficient ventilation or cooler temperatures will require longer cure times and could result in solvent entrapment and premature failure.

***Maximum recoat times are indefinite.** Surface must be clean and dry. As part of good painting practice it is recommended to test for adhesion by wiping the surface with Thinner 25. If the film shows a slight "tack" the surface is suitable for recoating without extensive surface preparation such as abrading.

Carboline Additive 101 can be used to accelerate the film forming process in this product for conditions outside of the parameters of this data sheet. Carboline Additive 101 is added at a rate of 1.0-2.0 oz per mixed gallon or a maximum of 6 oz per mixed five gallons. At this addition rate, Additive 101 will accelerate the cure rate of the urethane product between 25-40% depending on the substrate temperature range and reduce the pot life of the product by approximately 40-50% of that stated on the product data sheet. With the use of Additive 101, this product will continue to cure at temperatures as low as 20°F (-7°C).

Cleanup & Safety

Cleanup	Use Thinner 2 or Acetone. In case of spillage, absorb and dispose of in accordance with local applicable regulations.
Safety	Read and follow all caution statements on this product data sheet and on the MSDS for this product and use personal protective equipment as directed.
Ventilation	When used in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. User should test and monitor exposure levels to insure all personnel are below guidelines. If not sure or if not able to monitor levels, use MSHA/NIOSH approved supplied air respirator.

Packaging, Handling & Storage

Shelf Life	Part A: Min. 24 months at 75°F (24°C) Part B: Min. 24 months at 75°F (24°C) *Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.
Shipping Weight (Approximate)	1 Gallon Kit - 15 lbs (7 kg) 5 Gallon Kit - 70 lbs (32 kg)
Storage Temperature & Humidity	40° -110°F (4°-43°C) 0-90% Relative Humidity
Flash Point (Setaflash)	Part A: 68°F (20°C) Part B: 28°F (-2°C)
Storage	Store Indoors. This product is solvent based and not affected by excursions below these published storage temperatures, down to 10°F, for a duration of no more than 14 days. Always inspect the product prior to use to make sure it is smooth and homogeneous when properly mixed.



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